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THE INFLUENCE OF Mn 3d ELECTRONS ON $Cd_{1-x}Mn_xTe$ FUNDAMENTAL REFLECTIVITY SPECTRA

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An influence of the Mn $3d^5$ electrons of $Cd_{1-x}Mn_xTe$ in the 0.5-34 eV energy range has been analyzed. The studies of light reflection in three overlapping energy ranges 0.5-5.9 eV, 5.0-11.0 eV and 10.5-34 eV were carried out. To the measurements in the two last energy ranges were applied a synchrotron radiation light beam from the storage ring Adone. In the 1.5-6.0 eV energy range known earlier strong modification of the reflectivity spectrum with increasing of the Mn content was confirmed. Also a significant influence of Mn doping on the reflectivity spectrum in 6-9 eV energy range was discovered. The extraction of the characteristic features of reflectivity spectra in 1.5-9 eV energy range indicates the hybridization of the Mn $3d^5$ electrons with s-p like spin orbit splitted valence band in terms suggested by Taniguchi at al.[1]. In contrast to the behaviour of reflectivity spectrum in 1.5-9 eV energy range, in 10.5-34 eV range, in which are observed mainly the transitions from Cd 4d core states to the conduction band, no significant changes of spectrum are observed.

References:

(1) M.Taniguchi et al., Phys. Rev., to be published.